BIAS;

The difference of potential between 2 points or elements.

Forward Bias Mode;

Forward Bias Mode; Occurs when the difference of potential or polarity agrees w/the polarity of the material. The Diode Acts like a short, Resistance is minimum & Current flow is maximum. The Diode will Drop 600 mV across it.

Junction Barrier Potential

Junction Barrier Potential is met, the Depletion region collapses, conduction occurs @ 600 mV for Silicon & 100 mV for Germanium.

Reverse Bias Mode;

Reverse Bias Mode; Occurs when the polarity or the difference of potential does not agree W/ the polarity of the Material.

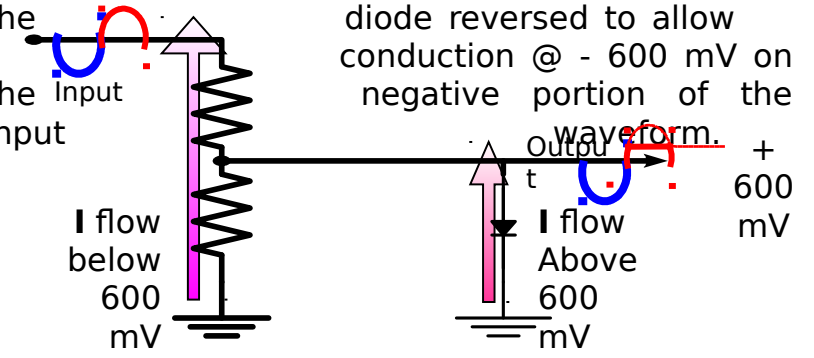
PRV, PIV, Avalanche;

W/the ↑ of Reverse Voltage, Resistance ↑ with the expansion of Depletion region. The Diode Acts like an open. If the Reverse Voltage is increased beyond the limits of the device, [PRV] Peak Reverse Voltage, or Peak Inverse Voltage [PIV], rapid current flow results [Avalanches] & destroys the diode.

Positive 1/2 Wave Limiter;

Current flows thru the resistor until + 600 mV is reached, then flows thru the Diode. The plateau is representative of a voltage drop of 600 mV the diode is dropping while it is conducting. **Negative ½ Limiter** has the diode reversed to allow conduction @ - 600 mV on the negative portion of the input waveform.

Negative ½ Wave Limiter;



Fullwave Limiter;

Fullwave Limiter has two diodes wired in opposite directions. One allows conduction at - 600 mV the other allows conduction +600 mV of the input waveform.

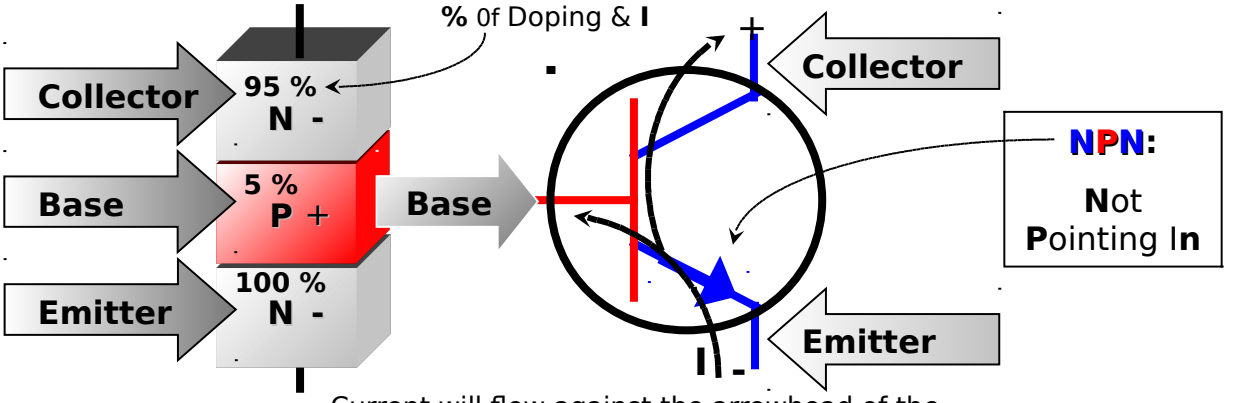
TI: CONDENSERS.
BASIC TRANSISTOR.

Transistor;

Symbol;
Q, Q1, 2 …

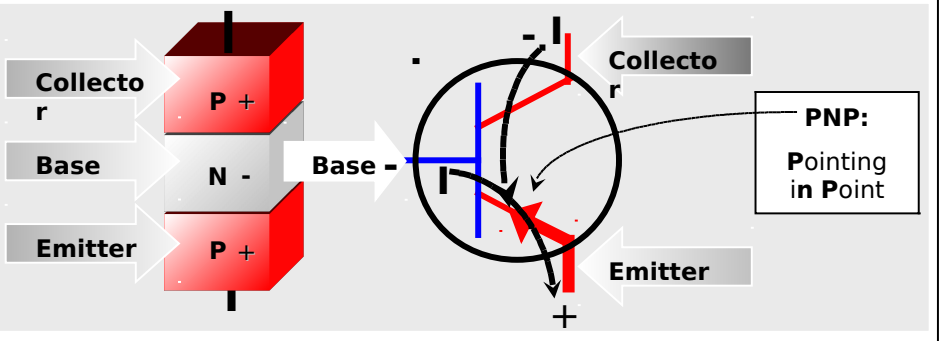
A Semiconductor device that will control a large amount of current w/a very small amount of current or voltage.
A Transistor is a Bipolar device, this refers to the two Majority Current Carriers, (+ Holes & - Electrons) and Two Junction Barriers.

NPN;



Current will flow against the arrowhead of the emitter.

PNP;



3 STATES of CONDUCTION;

F I R E;

TROUBLESHOOTING ;

A. Signal √.

DC Voltage Analysis;

B. DC Voltages √.

Ohms Confirmation √;

C. Ohms √ **Transistor;**

Procedure; Must be preformed in order.

A.	**B.**	**C.**
Locate Card/Ckt	***DC Checks***	***Confirmation***
1. √ **AC @ Output.**	**4.** √ **DC @ Collector.**	
		7. Ohms √
2. √ **AC @ Input.**	**5.** √ **DC @ Base.**	
3. √ **AC @ ½ Split.**	**6.** √ **DC @ Emitter.**	

Normal DC voltages is the point of reference that all symptom voltages are compared.

1. √ **DC @ Collector.** √ **DC @ Base.** √ **DC @ Emitter.**	**? In C/O** or **Sat.**
2. 1st 0. or **Short**↓	**Open**↑
3. Unexplained High. 12V @ Collector **is not** an unexplained High.	**Short**↑ or **Open**↓
4. TWO Voltages the Same.	**Short**
5. High on **Base & Emitter.** Go to the **one** that **Increased** the most. (Usually the Emitter.)	**Short**↑ or **Open**↓
6. The Most abnormal Low. or **Short**↓	**Open**↑

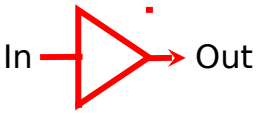
Set DMM on; **Diode.** Two measurements per check.

OPEN; **> .66** or **OL**. (**HI** = ∞ Ω)
SHORT; **< .65** or **Audible tone**. (**Lo** = 0 Ω)

Element		Normal	Short
Open			
1. Base to **C**ollector	HI/Lo	Lo/ Lo	Hi/Hi
2. Base to **E**mitter	HI/Lo	Lo/ Lo	Hi/Hi

TI: CONDENSERS.
Configurations I.

Amplification;



Amplification is the process of increasing the magnitude of a signal operating parameter, W/O changing the Frequency. The increase can be ; Voltage, Current, or Power.

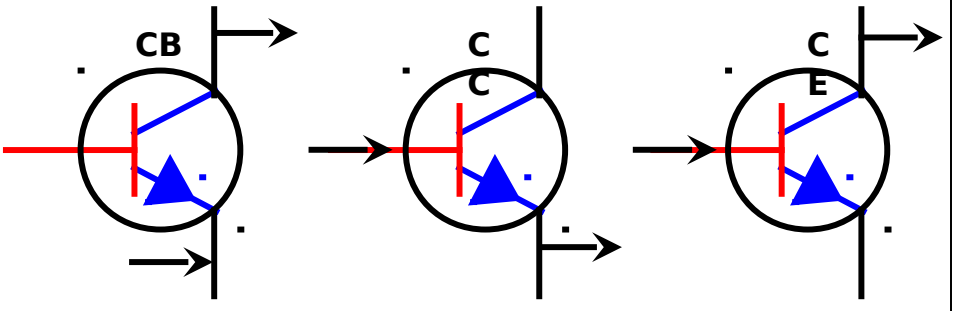
Gain;

Gain is the increment of measure that describes the increased magnitude of the output signal compared to the input signal.
Symbol is; **G**.
Formula; Gain = V pp Output, over V pp input

Output/Input = G

Amplifier Types;

Amplifiers are described by the Element that is common or the element that is not being used by either the Output or Input.



Common Base
Voltage Amp
V

Common Collector
Current Amp
I

Common Emitter
Power Amp
P

Amplifier Class;

Class	Input	Output, % of I	Fidelity	Efficiency
A			****	*
AB		**100%**	***	**
B		**99 - 51%**	**	***
C		**50%**	*	****

< 50%

2 Modes of operation;

Static, DC is Applied.
Dynamic, AC is Applied.

TI: CONDENSERS.
Configurations II.

Common Base Amp;

Input is on the Emitter.

Output is on the Collector.

Voltage Amplifier.

[**E is >1**] [**I is < 1**]

V **I** **P**

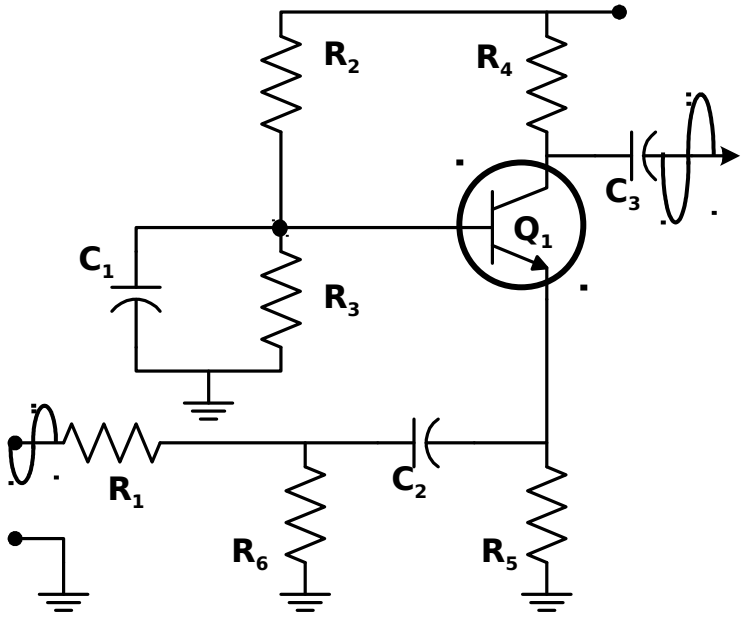
B **C** **E**

Output signal is in phase w/ the input signal.

Operates well w/high Frequencies.

Low input impedance.

High output Impedance.



Common Collector Amp;

Input is on the Base.

Output is on the Emitter.

Current Amplifier.

[**I is > 1**] [**E is < 1**]

V **I** **P**

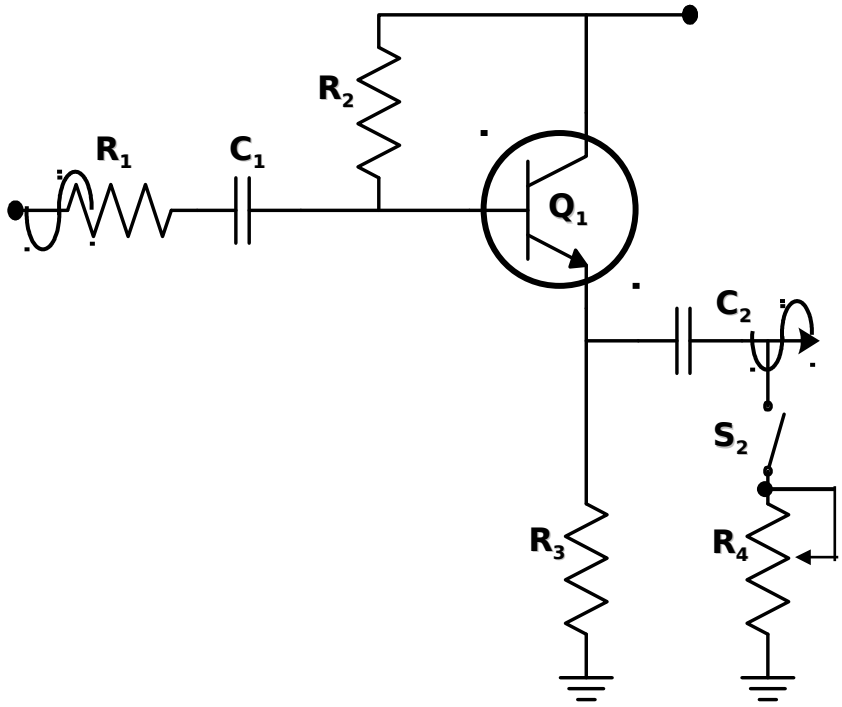
B **C** **E**

Output signal is in phase w/ the input signal.

Referred to as a Emitter Follower.

Use as Buffers between a primary Ckt & the load.

Used as Regulators & for Impedance matching.



TI: CONDENSERS.
Configurations III.

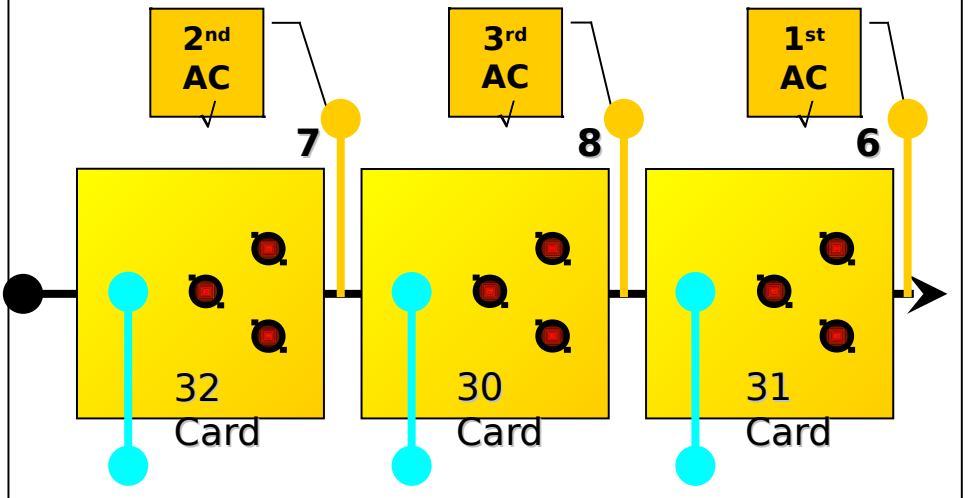
Troubleshooting;

Locate the Defective Card, AC Check Sequence.

1.

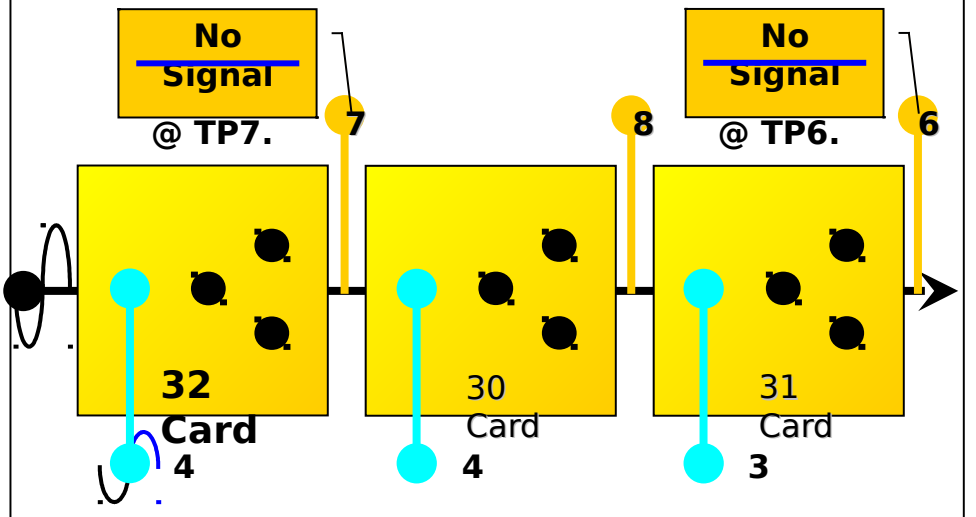
Checking AC outputs,

½ Split Method,



2.

32 Card is Malfunctioning. Confirm & Record **AC Input** @ TP4.



3.

Record DCV @ **TP 5, 2, 4.**